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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,252	01/31/2002	Dennis J. O'Rear	005950-725	6566

7590

03/25/2003

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EXAMINER

GRIFFIN, WALTER DEAN

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 03/25/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-5

Office Action Summary

Application No.

10/059,252

Applicant(s)

O'REAR ET AL.

Examiner

Walter D. Griffin

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: A serial number is missing in line 3 of page 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 4, 5, and 8-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garwood et al. (US 3,972,958) in view of Grahame (US 2,452,121).

The Garwood reference discloses a process for manufacturing a high-octane gasoline. The process comprises reacting a mixture of carbon oxides and hydrogen in the presence of a catalyst and recovering the resulting hydrocarbon product mixture. The product mixture is then separated into fractions including a C₅+ gasoline and an alkylation feed comprising C₃ and C₄ olefins. This alkylation feed, which also contains isobutane, is reacted in the presence of an alkylation catalyst to produce an alkylate with a high octane number. The octane number of the alkylate would necessarily be within the claimed range because the reactants are the same as claimed. See col. 1, line 58 through col. 2, line 49 and col. 7, lines 31-42 and 53-62.

The Garwood reference does not disclose treating the olefin fraction with a dehydration/isomerization catalyst. The Garwood reference also does not disclose the claimed oxygenate content, does not disclose the claimed molar ratios of 2-butene to total butenes, does not disclose the acid value of claim 11, does not disclose including a heavier fraction with the olefin fraction before contact with the dehydration/isomerization catalyst, and does not disclose a temperature within the range of claim 15.

The Grahame reference discloses a process for manufacturing fuels from synthetic hydrocarbons. The process comprises reacting carbon monoxide and hydrogen in the presence of a catalyst (i.e., alumina catalyst) thereby producing a mixture of hydrocarbons. At least a fraction of the mixture of hydrocarbons contacts a catalyst at conditions that result in the conversion of oxygenated compounds (e.g., alcohols) present in the hydrocarbon fraction to olefins. Conditions include temperatures ranging from 700° to 900°F, pressures ranging from atmospheric up to

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about 25 psi, and space velocities ranging from 1 to 10. Additionally, the olefins present in the fraction are isomerized. The C₃ and C₄ olefins present in the resulting converted fraction may be further treated to produce naphtha. See col. 1, lines 1-48; col. 2, lines 15-29, 54, and 55; col. 3, lines 1-13 and 56-75; col. 4, lines 1-67; col. 5, lines 14-58; and col. 6, lines 21-32 and 59-64.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Garwood by treating the olefin fraction with a dehydration/isomerization catalyst as suggested by Grahame because undesirable oxygenates will be removed as well as more of the desired olefins will be produced. The presence of more of the desired olefins in the process of Garwood will result in the production of more of the desired product. Since Grahame also discloses that heavier fractions can be treated, it would have been obvious to one having ordinary skill in the art at the time the invention was made to include a heavier fraction with the olefins and treating this fraction because the treatment will result in the improvement of octane value for the heavier fraction.

Modifying the Garwood process by including the treatment of Grahame would result in the claimed molar ratios of 2-butene to total butenes since the isomerization of Grahame results in a shift of the double bond toward the center position of the carbon chain.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Garwood by reducing the oxygenate level to the claimed levels because a higher conversion of oxygenates results in a greater amount of desired hydrocarbons in the treated product. One having ordinary skill in the art would convert the oxygenates so that the oxygenates level is as low as possible (i.e., within the claimed ranges) in order to maximize the production of desired hydrocarbons.

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It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Garwood by utilizing an olefin stream having the claimed acid number since the process of Grahame discloses the removal of acids from the hydrocarbons thereby suggesting the use of olefin streams from which the acids have been removed. Non-acidic streams would have acid numbers within the claimed range.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the references by utilizing temperatures within the claimed range because lower temperatures would be expected to result in desired conversion although the rate of conversion may be less as compared to the use of higher temperatures.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garwood et al. (US 3,972,958) in view of Grahame (US 2,452,121) as applied to claim 2 above, and further in view of Boersma et al. (US 4,234,412).

Neither of the previously discussed references discloses that the isoparaffin stream is obtained by subjecting a 300°F+ stream to conversion.

The Boersma reference discloses that natural gas can be converted to carbon monoxide and hydrogen, which in turn can be converted to hydrocarbons. The resulting hydrocarbons can be fractionated to obtain a heavy fraction having an initial boiling point of 300°F. This heavy fraction can be hydrotreated to produce isobutane, which can be used with C₃-C₅ olefins in an alkylation process. See col. 1, lines 9-26; col. 4, lines 6-33 and 49-68; col. 5, lines 1-8; and claims 1 and 6.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by obtaining isobutane as suggested by Boersma because utilizing isobutane produced by Boersma results in a greater amount of gasoline produced.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garwood et al. (US 3,972,958) in view of Grahame (US 2,452,121) as applied to claim 1 above, and further in view of Ireland et al. (US 4,041,097).

Neither of the previously discussed references discloses further removal of oxygenates by, for example, water washing.

The Ireland reference discloses water washing to remove oxygenates. See col. 7, lines 62-66.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the previously discussed references by including an additional oxygenate removal step as suggested by Ireland because the concentration of undesirable oxygenates will be further reduced.

Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garwood et al. (US 3,972,958) in view of Grahame (US 2,452,121), Boersma et al. (US 4,234,412), and Ireland et al. (US 4,041,097).

The Garwood reference discloses a process for manufacturing a high-octane gasoline. The process comprises reacting a mixture of carbon oxides and hydrogen in the presence of a catalyst and recovering the resulting hydrocarbon product mixture. The product mixture is then separated into fractions including a C₅+ gasoline and an alkylation feed comprising C₃ and C₄

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olefins. This alkylation feed, which also contains isobutane, is reacted in the presence of an alkylation catalyst to produce an alkylate with a high octane number. The octane number of the alkylate would necessarily be within the claimed range because the reactants are the same as claimed. See col. 1, line 58 through col. 2, line 49 and col. 7, lines 31-42 and 53-62.

The Garwood reference does not disclose treating the olefin fraction with a dehydration/isomerization catalyst. The Garwood reference also does not disclose that the isobutane stream is obtained by subjecting a 300°F+ stream to conversion, does not disclose subjecting the treated olefin stream to a further treatment such as water washing, does not disclose the claimed oxygenate content, does not disclose the claimed molar ratio of 2-butene to total butenes, and does not disclose a temperature within the range as in claim 20.

The Grahame reference discloses a process for manufacturing fuels from synthetic hydrocarbons. The process comprises reacting carbon monoxide and hydrogen in the presence of a catalyst (i.e., alumina catalyst) thereby producing a mixture of hydrocarbons. At least a fraction of the mixture of hydrocarbons contacts a catalyst at conditions that result in the conversion of oxygenated compounds (e.g., alcohols) present in the hydrocarbon fraction to olefins. Conditions include temperatures ranging from 700° to 900°F, pressures ranging from atmospheric up to about 25 psi, and space velocities ranging from 1 to 10. Additionally, the olefins present in the fraction are isomerized. The C₃ and C₄ olefins present in the resulting converted fraction may be further treated to produce naphtha. See col. 1, lines 1-48; col. 2, lines 15-29, 54, and 55; col. 3, lines 1-13 and 56-75; col. 4, lines 1-67; col. 5, lines 14-58; and col. 6, lines 21-32 and 59-64.

The Boersma reference discloses that natural gas can be converted to carbon monoxide and hydrogen, which in turn can be converted to hydrocarbons. The resulting hydrocarbons can

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be fractionated to obtain a heavy fraction having an initial boiling point of 300°F. This heavy fraction can be hydrotreated to produce isobutane, which can be used with C₃-C₅ olefins in an alkylation process. See col. 1, lines 9-26; col. 4, lines 6-33 and 49-68; col. 5, lines 1-8; and claims 1 and 6.

The Ireland reference discloses water washing to remove oxygenates. See col. 7, lines 62-66.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Garwood by treating the olefin fraction with a dehydration/isomerization catalyst as suggested by Grahame because undesirable oxygenates will be removed as well as more of the desired olefins will be produced. The presence of more of the desired olefins in the process of Garwood will result in the production of more of the desired product.

Modifying the Garwood process by including the treatment of Grahame would result in the claimed molar ratios of 2-butene to total butenes since the isomerization of Grahame results in a shift of the double bond toward the center position of the carbon chain.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Garwood by reducing the oxygenate level to the claimed levels because a higher conversion of oxygenates results in a greater amount of desired hydrocarbons in the treated product. One having ordinary skill in the art would convert the oxygenates so that the oxygenates level is as low as possible (i.e., within the claimed ranges) in order to maximize the production of desired hydrocarbons.

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It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the teachings of the references by utilizing temperatures within the claimed range because lower temperatures would be expected to result in desired conversion although the rate of conversion may be less as compared to the use of higher temperatures.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Garwood by obtaining isobutane as suggested by Boersma because utilizing isobutane produced by Boersma results in a greater amount of gasoline produced.

It also would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Garwood by including an additional oxygenate removal step as suggested by Ireland because the concentration of undesirable oxygenates will be further reduced.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

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Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-20 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-16 of copending Application No. 10/059388 in view of Grahame (US (US 2,452,121)).

Claims 1-16 are drawn to a process in which olefins are combined with isobutane and the mixture is subjected to alkylation. The claims do not include the dehydration/isomerization step.

The Grahame reference discloses a process for manufacturing fuels from synthetic hydrocarbons. The process comprises reacting carbon monoxide and hydrogen in the presence of a catalyst (i.e., alumina catalyst) thereby producing a mixture of hydrocarbons. At least a fraction of the mixture of hydrocarbons contacts a catalyst at conditions that result in the conversion of oxygenated compounds (e.g., alcohols) present in the hydrocarbon fraction to olefins. Conditions include temperatures ranging from 700° to 900°F, pressures ranging from atmospheric up to about 25 psi, and space velocities ranging from 1 to 10. Additionally, the olefins present in the fraction are isomerized. The C₃ and C₄ olefins present in the resulting converted fraction may be further treated to produce naphtha. See col. 1, lines 1-48; col. 2, lines 15-29, 54, and 55; col. 3, lines 1-13 and 56-75; col. 4, lines 1-67; col. 5, lines 14-58; and col. 6, lines 21-32 and 59-64.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified claims 1-16 by including the dehydration/isomerization step as suggested by Grahame because undesirable oxygenates will be removed as well as more of the desired olefins will be produced. More of the desired olefins in the process of Garwood will result in the production of more of the desired product

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This is a provisional obviousness-type double patenting rejection.

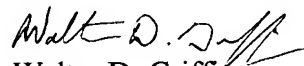
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art not relied upon discloses processes for upgrading F-T products.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter D. Griffin whose telephone number is 703-305-3774. The examiner can normally be reached on Monday-Friday 6:30 to 4:00 with alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0651.


Walter D. Griffin
Primary Examiner
Art Unit 1764

WG
March 19, 2003